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10/647,376

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Yoshikazu Miyajima

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EXAMINER

GUTIERREZ, KEVIN C

ART UNIT

PAPER NUMBER

2851

DATE MAILED: 02/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-----------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/647,376 | MIYAJIMA, YOSHIKAZU | |
| | Examiner | Art Unit | |
| | Kevin Gutierrez | 2851 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2005.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Species II (Figure 7) in the reply filed on December 16, 2005 is acknowledged and considered. However, there is no provided reasoning for the applicant's election with traverse. Therefore, it is held that the election made is **without** traverse.

Response to Arguments

2. Applicant's arguments filed December 16, 2005 have been fully considered. The applicant states that the publication to Goldstein is not understood to disclose or suggest the limitations recited in claim 17. Goldstein discloses a mirror having a reflection surface, a heat-radiation plate (225; cooling/heating elements) arranged opposite and spaced away from said reflection surface of said mirror and a outside passage area for the light to be incident on and reflected from said reflection surface (fig. 2, where the cooling/heating elements 225 is located below the optical surface 210 (reflection surface), which is opposite and spaced away from the reflection surface, and light is permitted to be incident on and reflected light of the reflection surface due to the farther location of cooling/heating elements 225), and a cooling mechanism configured to cool said heat-radiation plate ([0017] and [0024], lines 7-10)." Therefore, the publication of Goldstein discloses the limitations of the present invention.

Claim Objections

3. Claim 26 and 28 are objected to because of the following informalities:

(a) the following fails to provide proper antecedent basis: Page 13, claim 26 - “the amount of the light” and “the estimated amount”.

(b) Claim 28 depends on a cancelled claim. However, as best the Examiner can ascertain the claimed invention, it is assumed that claim 28 depends from the independent claim 17.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 17-24 and 29-31 are rejected under 35 U.S.C. 102(e) as being anticipated by Goldstein (US 2003/0169520).

Regarding claim 17, Goldstein discloses

- “a mirror (100) having a reflection surface (102) that reflects light ([0013], lines 2-3);

- a heat-radiation plate (225; cooling/heating elements) arranged opposite and spaced away from said reflection surface of said mirror and a outside passage area for the light to be incident on and reflected from said reflection surface (fig. 2, where the cooling/heating elements 225 is located below the optical surface 210 (reflection surface), which is opposite and spaced away from the reflection surface, and light is permitted to be incident on and reflected light of the reflection surface due to the farther location of cooling/heating elements 225); and

- a cooling mechanism configured to cool said heat-radiation plate ([0017] and [0024], lines 7-10).”

Regarding claim 18, Goldstein discloses further comprising a thermometer (302; temperature sensors or the like [0022], lines 5-6) configured to detect the temperature of said mirror ([0020], lines 1-5), wherein said cooling mechanism is configured to cool said heat-radiation plate based on the detection obtained by said thermometer ([0024], lines 2-5. where a correction signal utilized to cool cooling/heating elements 225).”

Regarding claim 19, Goldstein discloses “wherein said heat-radiation plate is separated and arranged at plural positions so as to comprise separated plural heat-radiation plates ([0016] and [0023], lines 4-6).”

Regarding claim 20, Goldstein discloses “wherein the passage area is arranged between said separated plural heat-radiation plates ([0016], lines 1-6).”

Regarding claim 21, Goldstein discloses “wherein one of said plural heat-radiation plates is arranged opposite said reflection surface of said mirror, and

another of said separated plural heat-radiation plates is arranged opposite an outer surface, of said mirror, different from said reflection surface ([0016], lines 1-7)."

Regarding claim 22, Goldstein discloses "wherein said heat-radiation plate has a form corresponding to the form of said reflection surface of said mirror ([0020], lines 4-6 and [0016], lines 1-6)."

Regarding claim 23, "Goldstein discloses "wherein said cooling mechanism is configured to cool said separated plural heat-radiation plates individually ([0024], lines 1-5)."

Regarding claim 24, "Goldstein discloses "wherein said cooling mechanism is configured to cool said heat-radiation plate by circulating coolant ([0024], lines 7-10)."

Regarding claims 29-31, Goldstein discloses "wherein said mirror is configured and positioned to guide the light to the substrate, one of a light source apparatus configured to generate the light, an illumination apparatus configured to guide the light from a light source to the reticle, and a projection apparatus configured to project the light from the reticle to the substrate, and developing the exposed substrate and processing the developed substrate to fabricate the device ([0001], where the reflective optical system is used in a lithography process)."

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goldstein in view of Jurca (6,118,527) and Lim (US 2002/0089652).

Regarding claim 25, Goldstein discloses a first thermometer (302) configured to measure the temperature of said mirror, and a controller configured to estimate the amount of the light incident on said mirror ([0027-0028], where temperature map implements radiation by light), a plurality of thermometers ([[0022], lines 1-6), and a control system to control temperature adjusting elements ([0017]).

Goldstein does not disclose “a second thermometer configured to measure the temperature of the coolant; and a controller configured to estimate the amount of the light incident on said mirror and to control the temperature of the coolant based on the measurement obtained by said first thermometer and second thermometer and the estimated amount of light.”

Jurca discloses a thermometer configured to measure the temperature of a coolant (col. 4, lines 26-29).

Lim discloses controlling light exposure based on temperature information (see Abstract).

However, having a cooling mechanism as aforementioned is known to the art as it is evident by the teachings of Jurca and Lim. Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the cooling mechanism of Goldstein in a manner described above for at least the purpose to monitor temperature variations within the optical system.

Regarding claim 26, Goldstein further discloses “wherein said first thermometer is a radiation thermometer ([0022], lines 4-6) arranged away from said mirror ([0020], lines 4-6).”

8. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goldstein in view of Eitel et al (4,844,603).

Goldstein discloses a cooling mechanism comprising of a heat-radiation plate (225), and a liquid to flow to control temperature of said heat-radiation plate ([0024], lines 3-10). Goldstein does not disclose “a solid heat-transfer element attached to said heat-radiation plate and configured to transfer heat from said heat-radiation plate; and a circulation mechanism that circulates cooling liquid or cooling gas so as to cool said solid cooling element.”

However, it having “a solid heat-transfer element attached to said heat-radiation plate and configured to transfer heat from said heat-radiation plate; and a circulation mechanism that circulates cooling liquid or cooling gas so as to cool said solid cooling element” is known to the art as it is evident by the teaching of Eitel et al (col.4, lines 20-25 and 27-29). Thus, it would have been obvious to one ordinary

skilled in the art at the time the invention was made to modify the temperature control mechanism of Goldstein by having a cooling element attached to the radiation plate with a circulation mechanism for the fluid to flow for at least the purpose to reduce any undesired heat transfers within the system.

9. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goldstein in view of Taniguchi (US 2001/0048514).

Goldstein discloses a mirror and a radiation plate. Goldstein does not disclose

- “a mirror barrel that accommodates said mirror;
- a mirror support, fixed to said mirror barrel, that holds said mirror in said mirror barrel;
- and a heat-radiation plate support, fixed to said mirror barrel, that holds said heat-radiation plate in said mirror barrel.”

However, having “a mirror barrel that accommodates said mirror; a mirror support, fixed to said mirror barrel, that holds said mirror in said mirror barrel; and a heat-radiation plate support, fixed to said mirror barrel, that holds said heat-radiation plate in said mirror barrel” is known to the art as it is evident by the teaching of Taniguchi ([0057], lines 3-6, where Taniguchi teaches a lens group used in a mirror barrel).” Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the mirror of Goldstein by including a mirror barrel with a radiation plate support member fixed to the mirror barrel. The ordinary artisan would have been motivated to modify Goldstein in a manner

described above for at least the purpose to reduce vibrations throughout the optical system.

10. Claims 29-31 rejected under 35 U.S.C. 103(a) as being unpatentable over Minnaert et al (US 2002/0171818) in view of Goldstein.

Goldstein discloses all of the limitations of the claimed invention and further discloses the reflection mirror apparatus used in a lithography process. Goldstein does not mention a substrate, reticle, light source, projection apparatus, and developing and processing of the substrate.

However, it is inherent that the aforementioned above is in a lithography process as it is known to the art and evident by the teaching of Minnaert et al. (see Abstract). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to modify Minnaert et al. to have the reflection mirror apparatus the optical system of Goldstein for at least the purpose of controlling the temperatures of optical elements.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Gutierrez whose telephone number is (571)-272-5922. The examiner can normally be reached on Monday-Friday: 7:30 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on (571)-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kevin Gutierrez
Examiner
Art Unit 2851

February 8, 2006

William Perkey
Primary Examiner